

FLAT PANEL TV SCREEN FRAME SYSTEM

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TECHNICAL FIELD

This invention relates to wall mountable flat panel TV screens, such as plasma and LCD screens or display monitors, and to structure associated therewith to frame the screen with the option to facilitate use of interchangeable electronic module components with the screen and/or provide wireless connection to remote devices.

BACKGROUND OF THE INVENTION

Flat panel TV screens, such as plasma and LCD screens, are becoming increasingly popular and affordable. Such screens are often mounted on a room wall. This can result in a somewhat less than aesthetic appearance. Also, electronic equipment employed in association with the screen can present its own problems. Not only is such equipment exposed to view, it often is located at a location or locations remote from the screen itself. Separate cabinetry can be utilized to accommodate the equipment; however, this can be inconvenient as well as

relatively expensive. Then too, wires and electrical interconnections between such equipment and the screen present an unsightly appearance.

As will be seen below, the system of the present invention incorporates a frame which not only improves the appearance of the flat panel TV screen but also can be utilized to hold electronic modular equipment associated with the screen and maintain such equipment essentially hidden from view. This not only eliminates the need for existing equipment to be right next to or below the TV, but also eliminates from view interconnecting wiring.

According to one embodiment of the invention, the frame can accommodate a wireless receiver to transfer information from remote devices to the TV with which the frame is associated.

A search of the prior art located the following: U.S. Patent No. 4,002,831, issued January 11, 1977, U.S. Patent No. 6,266,069, issued July 24, 2001, U.S. Patent No. 3,294,905, issued December 27, 1966, U.S. Patent No. 5,564,209, issued October 15, 1996, U.S. Patent No. 6,550,172, issued April 22, 2003, U.S. Patent No. 5,638,096, issued June 10, 1997, U.S. Patent No. 6,543,167, issued April 8, 2003, U.S. Patent No. 4,675,755, issued June 23, 1987, U.S. Patent No. 5,543,925, issued August 6, 1996, U.S. Design Patent No. 473,877, issued April 29, 2003, U.S. Design Patent No. 392,682, issued March 24,

1998 and Patent Application Publication No. US 2003/0093445.

Although it is known in the prior art to incorporate decorative adornments and cases with standard cathode ray tube television sets and computer monitors, there is no disclosure of a frame in conjunction with flat panel wall mountable TV screens, such as plasma and LCD screens. Furthermore, there is no teaching of the features of applicant's invention as disclosed and claimed herein relating to utilization of frame structure with other system components to hold electronic module equipment to be utilized in association with the flat panel TV screen or as a wireless receiver for external remote components.

#### DISCLOSURE OF INVENTION

The present invention is directed to a combination incorporating a flat panel TV screen and a frame defining a frame opening.

Connector structure releasably connects the frame to the flat panel TV screen with the frame surrounding the flat panel TV screen and the flat panel TV screen is observable through the frame opening.

The flat panel TV screen includes a housing. The connector structure extends between the housing and the frame.

The combination additionally includes an electronic component receptacle connected to the frame and defining a receptacle interior for receiving at least one modular electronic

component selectively operatively associated with the flat panel TV screen.

The frame can have built into it a wireless receiver that receives information from a remote transmitter that connects to existing electronic components, e.g., DVDs, VCRs or computers.

Other features, advantages and objects of the present invention will become apparent with reference to the following description and accompanying drawings.

#### **BRIEF DESCRIPTION OF DRAWINGS**

Fig. 1 is an exploded, perspective view illustrating a flat panel TV screen and a frame therefor prior to interconnection of the frame with the flat panel TV screen by brackets;

Fig. 2 is an exploded, perspective view illustrating components of a second embodiment of the invention;

Fig. 3A is a perspective, exploded view of a third embodiment of the invention;

Fig. 3B illustrates the structural components of the embodiment of Fig. 3A in assembled condition;

Fig. 3C is a greatly enlarged, cross-sectional view taken along the line 3C-3C in Fig. 3A;

Fig. 3D is a perspective view of a mat holding frame employed in the embodiment of Fig. 3A;

Fig. 4 is an exploded, perspective view of components of a fourth embodiment of the invention, illustrating an electronic component receptacle and three modular electronic components selectively housed thereby;

5 Fig. 5 illustrates in schematic fashion an electronic component receptacle attached to a frame of another embodiment of the invention along with one electronic component, prior to insertion of the latter into the receptacle connector structure, and a multi-outlet electrical connector in the form of a power  
10 strip prior to positioning of the power strip in an electrical connector receptacle formed in the frame;

Fig. 6 is a perspective view illustrating a flat panel TV screen in position on a frame such as that shown in Fig. 5, but with other components of the system separated from the  
15 combined screen/frame;

Fig. 7 is a greatly enlarged, side elevational view of the assembled frame, flat panel TV screen and electronic component receptacle as incorporated in the embodiment of Fig. 5;

Fig. 8 is an enlarged, exploded, side elevational view  
20 illustrating an alternative approach to attaching an electrical connector receptacle to a frame;

Fig. 9 is a top plan view of a completed assembly incorporating the components of Fig. 8;

Fig. 10 is an exploded view of an arrangement similar to that shown in Figs. 8 and 9, but illustrating the use of two electronic receptacles; and

Fig. 11 is an exploded view illustrating a frame employed as a receiver to establish a wireless interconnection between a TV and remote electronic components.

#### MODES FOR CARRYING OUT THE INVENTION

Fig. 1 shows a flat panel TV screen 10 of conventional construction including a housing 12 surrounding the central screen viewing area. A frame 14 is shown prior to application thereof to the screen. The frame 16 may be formed of any suitable material and may have any suitable configuration, the frame defining a frame opening 16. The frame opening is sized to receive the display portion of the screen and allow viewing thereof while covering the housing 12 to present a more pleasing appearance. Connector structure in the form of brackets 18 is utilized to releasably connect the frame 14 to the screen housing.

Fig. 2 shows another embodiment of the invention wherein brackets 22 in the form of elongated rails 22 are utilized to hold a flat panel TV screen 24 and a frame 26 together. The horizontal components of the brackets are secured to the back of the frame by any known expedient such as threaded fasteners (not shown) so that the vertical legs of the brackets

extend upwardly and downwardly spaced from the frame, enabling the screen 24 to be slid in position relative to the frame.

Figs. 3A - 3D illustrate another embodiment of the invention. In this arrangement, a flat panel TV screen 30 has  
5 loudspeakers 32 in the housing 34 of the screen. The loudspeakers are disposed on opposed sides of the viewing area of the screen. In this instance, the housing incorporates components of the TV of which the screen is a part.

A mat 36 formed of mesh or other sound transmissive  
10 material is disposed over the loudspeakers 32 and blocks the loudspeakers from view through the frame opening of frame 38 when the components are assembled. The mat defines a mat opening 40, the flat panel TV screen 30 being observable through the frame opening 42 and mat opening 40. The mat has a rectangular  
15 configuration and is sized to present a pleasing appearance and conform to diverse TV manufacturer's specifications while covering the loudspeakers and enabling the viewer to observe the display portion of the screen 30. The mat may be formed of material allowing passage of remote control signals.

20 Conventional available brackets such as brackets 44 may be utilized to secure the assembly components together, such assembled condition being illustrated in Fig. 3B.

As may best be seen with reference to Figs. 3C and 3D, the mat 36 is stretched and maintained in a planar condition by a

rectangular shaped wire frame 46.

In the Fig. 4 embodiment, a flat panel TV screen 50 is operatively associated with a frame 52 and held in position relative thereto by elongated brackets 54. The brackets 54 are  
5 secured to the back of frame 52 by threaded fasteners such as screws (not shown) and form a confining rail arrangement engaging the top and bottom of the screen 50 and enabling the screen to be slid in place or slid out of place relative to the frame.

Fig. 4 also shows an electronic component receptacle 56  
10 which is connected to the frame and defines a receptacle interior for receiving three modular electronic components 58, 60, 62. These components may, for example, be such things as DVD players, digital camera card readers, or wireless receivers providing wireless communication with a computer or to a hub/transmitter  
15 connected to existing entertainment components.

Electronic component receptacle 56 is for placement behind the frame 52 so that it is essentially hidden from view by a person positioned in front of the flat panel TV screen. The electronic component receptacle is divided into three  
20 compartments 64, 66, 68, each defining a compartment interior. The receptacle interior is comprised of these compartment interiors, each compartment interior for receiving a modular electronic component. These components may be replaced or varied depending upon the requirements or desires of the user of the



system. More or less than three compartments could be employed.

Fig. 5 shows the electronic component receptacle 56 in place behind frame 70, the flat panel TV screen 72 not yet being installed in place. Modular electronic component 62 is shown prior to its entry into compartment 68. The output lead associated with component 62 leads to flat panel housing screen 72 of the TV while the power cord of component 62 is shown prior to being plugged into a socket of a multi-outlet electrical connector in the form of a power strip 74. Hidden lines at the bottom of the frame 70 depict an electrical connector receptacle 76 defined by the frame bottom which is utilized to store the socket end of the power strip, the sockets being oriented downwardly so that plug-in of the power cords of the flat panel TV and modular electronic components is facilitated.

Fig. 6 illustrates flat panel TV screen 72 in place on frame 70. For illustration purposes, the receptacle side of power strip 74 is disposed upwardly. The electronic components receptacle 56 is depicted as separated from the frame since it is attached to the frame after the flat panel TV screen is in place. Fig. 6 illustrates the fact that the output wire 78 of modular electronic component 62 is threaded through the electronic component receptacle prior to the component 62 being slid into position in the interior of compartment 68. A primary opening 80 leading to the compartment interior facilitates both installation

or removal of component 62. Auxiliary openings are formed at the back of electronic component receptacle 56 to allow the wire 78 to be passed through its associated compartment. Primary and auxiliary openings also communicate with the other compartment interiors of the receptacle 56.

Fig. 7 illustrates attachment of an electronic component receptacle 56 to a frame 52 utilizing the brackets 54 illustrated in Fig. 4. Fig. 8 shows brackets 54 in place on frame 52 with the flat panel TV screen 50 not yet seated in the channels formed by the opposed brackets 54. After such seating has occurred, separate L-shaped brackets 82 attached to the electronic component receptacle 56 are used to secure receptacle 56 to brackets 54. Fig. 10 differs from Fig. 9 in that two electronic component receptacles 56 are employed, rather than one. This increases the capacity of the system insofar as accommodation of modular electronic components is concerned.

Fig. 11 shows a frame 14 accommodating a built-in wireless receiver 90. The receiver is connected by wires to the TV and receives wireless transmissions from a remote transmitter or video sender 92 relaying signals from selected audio/video equipment such as VCR 94, DVD player 96 and satellite or cable receiver 98 or computer (not shown).